PROGRESS

OF

MEDICAL SCIENCE

MEDICINE

UNDER THE CHARGE OF
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Secondary Infection in Pulmonary Tuberculosis.—ROSWELL T. PETTIT (*Jour. Infect. Dis.*, 1911, ix). The degree of importance of secondary infections in pulmonary tuberculosis is disputed. Some consider the tubercle bacillus as responsible for practically all the pathological conditions of a tuberculous lung; others believe that secondary invaders, more often streptococcus, pneumococcus, or staphylococcus play a large role. Between these two extremes are those who assign a certain importance to both. Previously in attacking the problem, seven methods of attack have been employed—clinical observation, animal experimentation, bacteriological and anatomical examination of lung post mortem, or of sputum ante mortem, study of opsonic indices and of leukocytes, and finally of blood cultures. In reviewing the literature, varying results are reported by different observers. In regard to blood cultures, the findings of which have been long recognized as constituting most direct evidence, the varying results may be explained by technical differences. The earlier observers drew blood from the ear or finger, with a large percentage of positive results; while later workers have used venous blood with a small positive percentage. Pettit has studied 130 blood cultures, using a large quantity of blood (5 to 20 c.c.) from a vein, planting it on the most favorable media, and incubating for at least forty-eight hours. As possible contaminations, he has excluded all growths of any organism but pneumococcus or streptococcus, which he has differentiated by cultural and microscopic appearances, and reaction on serum-inulin agar or in serum-inulin water. As control, he has studied the blood of 21 normal individuals, using the same technique, all with negative results. He has obtained positive cultures in 46 per cent. of 130 cases, growing streptococcus from 36 patients, and pneumococcus from 24. Considering the results from other points of view, Pettit has found that of incipient cases, 16 per cent. were positive; of advanced, 45 per cent.; and of far advanced, 68 per cent.; of patients with an afternoon temperature below 100°, 34 per cent. showed positive blood cultures, as compared with 58 per cent. in those with higher afternoon temperatures. He concludes that the isolation of pneumococcus or streptococcus from the blood in so many cases shows that not only are true secondary invaders of frequent occurrence in pulmonary tuberculosis, but that often such organisms constitute a complication of great pathological significance.

The Incoagulable Nitrogen of Puncture Fluids, with Special Reference to Cancer.—From recent observations, that malignant tumors contain one or more proteolytic enzymes, ROGER S. MORRIS (*Arch. Int. Med.*, 1911, viii, 457) considered that primary or metastatic growths affecting serous surfaces might secrete their ferment directly into the serous cavity and fluid occupying it. That in those fluids resulting from pressure on vessels there should then be an absence of this ferment. In certain cases, therefore, there might well be an increase in the incoagulable nitrogen. With this idea in view, Morris has examined 25 fluids, removing the coagulable proteins according to the method of Hohlweg and Meyer, slightly modified. This consists, in brief, of precipitating the proteids by a reagent of acetic acid and monocalcium phosphate, and sodium chloride, and testing the filtrate for nitrogen by Kjeldahl's method. From the literature and his own cases, Morris has selected 78 observations. The fluids are divided into three groups according to their content in incoagulable protein, the nitrogen being expressed in grams per cent. Group I contains incoagulable nitrogen of 0.0699 gram per cent. or less; Group II, 0.07 to 0.0899 gram per cent.; and Group III, 0.09 to 0.1 gram or more per cent. Morris concludes that in analyzing these groups with reference to cancer, Group I contains 4 of cancer out of 59 fluids; Group II, 2 cases of cancer out of 5; and Group III, 3 of cancer out of 4. It thus appears that a puncture fluid with incoagulable nitrogen below 0.07 gram per cent. is probably not of malignant origin; while a very high percentage of incoagulable nitrogen is, to say the least, a suspicious circumstance.

Nephritic Edema.—P. SCHMID and SCHLAYER (*Deutsch. Arch. f. klin. Med.*, 1911, civ, 44) have made an experimental study of nephritic edema in rabbits. It had previously been shown that two types of experimental nephritis could be differentiated, not on anatomical but rather on functional grounds. The one presents a severe lesion of the tubules with secondary affection of the circulatory apparatus—"tubular" nephritis. The second variety, the "vascular," is characterized by a rapid and intense injury to the renal vessels. In these two types of experimental nephritis the present observations were made. Their purpose was not to study the role of the kidneys themselves, but rather to determine the part played by prerenal factors, namely, the functional activity of the bloodvessels of the body and that of the tissues. The method of approach was as follows: Hyper- and hypotonic solutions of sodium chloride were injected subcutaneously. The hemoglobin and blood chlorides were determined before, immediately after the infusion, and again at the end of one-half an hour. To eliminate diuresis as a factor, and to throw the full burden on the circulation and tissues, only those nephritic animals were used which had become completely anuric. Preliminary observations were made on (1) normal animals, (2) on those whose ureters had been ligated, and (3) on nephrectomized rabbits. To produce tubular nephritis, they employed potassium chromate; vascular nephritides were caused by arsenic, cantharidin, and uranium. The results which Schmid and Schlayer report cannot be given in the detailed form which their importance would seem to warrant. Briefly stated, they are as follows: The distribution of salt and water between blood and tissues differs when the kidneys are mechanically removed from the conditions found in experimental nephritis. In purely mechanical removal of the kidneys, the adjustment following injections of salt solutions is abnormally delayed; the blood retains unusually large quantities of water and salt. In the nephritides, the distribution of the injected solution varies according to the kind of nephritis under consideration. In the tubular nephritides (potassium chromate) one sees the same accumulation of water and salt in the blood that occurs in nephrectomized animals, but at the end of the experiment practically all of the solution has passed from the blood into the tissues. Here, then, there is an alteration in the sense of a slightly increased permeability of the vessels, following the primary collection of both water and salt in the blood. In the vascular nephritides (produced by arsenic, cantharidin, and uranium) the conditions are quite different. With increasing intoxication there is observed a correspondingly marked inability on the part of the vessels to retain water and salt in the blood; there is a total inability on the part of the vessels to remove the fluid from the tissues; finally, the permeability of the vessels for water and salt becomes so great that the infusion of salt solutions of high concentration no longer produces any change in the composition of the blood. These facts support the view, Schmid and Schlayer believe, that nephritic edema is caused through the coördination of a vascular lesion with an alteration of the body tissues. It is impossible to say whether the vascular condition is primary or whether both vessels and tissues are equally affected by the nephritic toxin.

On the Bence-Jones' Body.—R. Massini (*Deutsch. Arch. f. klin. Med.*, 1911, civ, 29) reports investigations made on a patient whose urine contained Bence-Jones' protein. Three lines of study were followed, and it was found (1) that a certain parallelism exists between the quantity of protein taken with the food and that of the Bence-Jones' body in the urine. This, therefore, points rather to a transformation of the food proteins into Bence-Jones' protein than to a production of the latter from marrow or tumor cells. (2) By means of deviation of complement with highly potent sera, it was possible to show definite quantitative differences between blood serum and Bence-Jones' protein. (3) Studies of the solubility of pure Bence-Jones' protein showed that the concentration of salts and acid determine largely its precipitability. Slight changes in concentration suffice to produce marked alterations in its coagulability. In this way Massini explains the contradictory reports in the literature on the more or less complete solution of the precipitate on boiling the urine.